IMPROVED PASSIVE MILLIMETER WAVE SENSOR USING HIGH TEMPERATURE SUPERCONDUCTING LEADS

ABSTRACT OF THE DISCLOSURE

A radiation sensor (20) has a substrate (34); an antenna (24) coupled to the substrate (34), a thermal detector unit TDU (22) spaced from the antenna (24) and the substrate (34); and a multi-layered conductive lead (30). The conductive lead (30) physically contacts the antenna (24) and the TDU (22). The conductive lead (30) defines a support layer (44) adjacent to the substrate (34) for structurally supporting the TDU (22) over a cavity defined by the substrate (34), a buffer layer (46) disposed on the support layer (44), and a superconductive layer (48) disposed on the buffer layer (46). The buffer layer has a crystalline structure to facilitate bonding with other layers. A method for making the sensor (20) is disclosed wherein the superconductive layer (48) and the buffer layer (46) are deposited using laser deposit, the buffer layer (46) with ion beam assist for alignment.